UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS GCE Ordinary Level

MARK SCHEME for the May/June 2010 question paper for the guidance of teachers

6065 FOOD AND NUTRITION

6065/01

Paper 1 (Written), maximum raw mark 100

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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F	Page 2	2	Mark Scheme: Teachers' version	Syllabus	Paper
			GCE O LEVEL – May/June 2010	6065	01
			Section A		
(a	a) (i)	sim swe	nosaccharides ple sugars – C ₆ H ₁₂ O ₆ – basic unit – end product of dige eet – soluble in water points) (2 points = 1 mark)	estion —	[2
	(ii)	dou swe bro	accharides uble sugars $-C_{12}H_{22}O_{11} - 2$ monosaccharides combined eet $-$ soluble in water $-$ glucose $+$ 1 other simple sugarken down to monosaccharides during digestion points) (2 points = 1 mark)		[3
	(iii)	ma not Noi pre cha stai	ysaccharides de up of many monosaccharides – insoluble in water – all polysaccharides can be digested – n Starch Polysaccharide (NSP) – adds bulk to diet – vents constipation/diverticulitis/varicose veins etc.– nin is branched – cannot break – rch can be digested – because molecules are linked togooints) (2 points = 1 mark)		e chain ['
	(iv)	in t amy cor in t amy in t willi hav glue the	pestion and absorption the mouth ylase/ptyalin – from salivary glands – acts on cooked state of the duodenum ylase – in pancreatic juice – converts starch to maltose the ileum Itase – in intestinal juice – converts maltose to glucose – finger-like projections – in walls of small intestine – we walls made of single cells – and a network of blood coose passes through walls of blood vessels – into blood in transported to liver points) (2 points = 1 mark)	– apillaries –	[4
	(v)	too exc ass risk 3 re	asons for reducing sugar intake th decay – bacteria change sugar to acids – dissolve er sess stored as fat – obesity – breathless – low self–este sociated with coronary heart disease (CHD) – varicose v of diabetes – too much glucose in blood for insulin pro- seasons + 3 explanations points) (2 points = 1 mark)	em – veins – hypertens	sion etc. [í

(vi) Ways of reducing sugar

avoid adding sugar to drinks – use artificial sweetener –
fewer sweets/chocolate – biscuits/cakes – reduce sugar in recipes –
use canned fruit in fruit juice instead of syrup –
drink low calorie drinks/Diet Coke – avoid fizzy drinks –
do not buy sugar-coated breakfast cereal – buy 'sugar free' products –
fewer convenience foods – study nutritional information on packaging
(6 points) (2 points = 1 mark)

[3]

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(b) (i)	form picks trans ener CO ₂ trans	ortance of iron lation of haemoglobin – red pigment in blood – s up oxygen from lungs – oxyhaemoglobin – sports oxygen to cells – oxidises glucose – cell respirat gy produced – leaving carbon dioxide and water – attaches to haemoglobin – carboxyhaemoglobin – ported to lungs – for breathing out/disposal bints) (2 points = 1 mark)	ion –	[2]
(ii)	liver, eggs dried gree	rces of iron /kidney – red meat (or one named e.g. corned beef) – s – cocoa/plain chocolate – curry powder – black treacl d fruit (or named e.g.) – pulses (or named e.g.) – soya en vegetables (or one named e.g.) pints) (2 points = 1 mark)		[2]
(iii)		ciency disease emia ark)		[1]
(iv)	pale feel	nptoms – tired/lethargic/fatigued – weak – headaches – dizzy/faint – lacks energy – breathless – pints = 1 mark)		[1]
(c) (i)	clear mak for p grow help abso	ortance of vitamin C r skin – building/maintenance of linings of digestive system of second connective tissue – to bind cells together – broduction of blood – and walls of blood vessels – immovth – helps to heal wounds/fractures – s to build strong teeth and gums – brotion of iron – antioxidant etc. bints) (2 points = 1 mark)		[2]
(ii)	citru strav gree	rces of vitamin C s fruit (or named e.g.) – blackcurrants – rose hips – wberries – melon – tomatoes – mango – green peppers n vegetables (or named e.g.) – new potatoes etc. pints) (2 points = 1 mark)	S –	[2]
(iii)	Defi Scur (1 m			[1]
(iv)	walls bruis gum as b	nptoms s of blood vessels weaken/break – blood escapes – ses appear under the skin – pain in muscles and joints s bleed – teeth loosen – heart failure – lood passes through walls of capillaries etc. pints = 1 mark)	_	[1]

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(d) Deficiency diseases

Not iron or vitamin C - in previous questions

Vitamin A/Retinol Night blindness/Xerophthalmia

Vitamin D/Cholecalciferol Rickets/osteomalacia

Vitamin B1/Thiamine Beri–beri

Vitamin B2/Riboflavin Dermatitis/cataracts

Vitamin B3/Nicotinic acid Pellagra

Vitamin B12/cobalamin Pernicious anaemia Folate/folic acid Anaemia/spina bifida

Calcium Rickets/osteomalacia/osteoporsis/tetany

Iodine Goitre
Protein Kwashiorkor

Carbohyrate/fat/protein Marasmus (lack of energy foods)

4 deficiency diseases × 1 point 4 associated nutrients × 1 point (8 points) (2 points = 1 mark)

(8 points) (2 points = 1 mark) [4]

(e) Planning meals for the elderly

small portions - appetite reduces with age

remove bones/skin etc. - eyesight may be poorer - food needs to be easy to eat/chew -

may need to cut into small pieces/mince - elderly may have few teeth

fewer carbohydrate foods - elderly may be less active

need protein foods - to repair worn out cells

iron - to prevent anaemia

vitamin C - to absorb iron - immunity

calcium/phosphorus – to maintain bones and teeth – for blood clotting – muscle function

vitamin D - to absorb calcium

soft foods – easier to eat

low in fat – easier to digest – reduces risk of CHD – obesity

reduce salt – reduces risk of hypertension/high blood pressure

reduce sugar - reduces risk of tooth decay and obesity - high sugar intake is linked to

diabetes

fruit and vegetables – NSP – less risk of constipation

variety of colour - flavour - texture - to add interest - make appetising

reduce spices and strong flavours - these are less easily tolerated

snack foods should be nutritious – include milk daily etc.

(12 points) (2 points = 1 mark)

[Section A Total: 40]

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Section B

2 (a) Nutrients in eggs

protein (or named e.g. ovalbumin/mucin/vitellin) – fat – vitamin A/retinol – vitamin D/cholecalciferol – vitamin B2/riboflavin (or vitamin B) – iron – phosphorus – sulfur (6 points) (2 points = 1 mark)

[3]

(b) Uses of eggs

main dish/breakfast/snack – trapping air/making mixtures rise –

lightening thickening setting

emulsifying

binding

coating glazing

enriching

garnishing

colour

5 uses + 5 examples

(10 points) (2 points = 1 mark)

omelette, scrambled egg, boiled egg etc.

Swiss roll, sponge flan etc. mousse, meringue, soufflé custard, sauces, soup etc.

quiche, rich cakes, baked egg custard etc.

mayonnaise, rich cakes etc.

croquettes, fish cakes, stuffing etc.

Scotch eggs, fish fillets etc.

pastry, bread etc.

sauces, milk pudding, soup etc.

salad, dressed crab, omelette strips etc.

pastry, cake etc.

[5]

(c) Storage of eggs

cool place/refrigerator - keep longer -

not too dry - water evaporates -

in an egg box/special rack in fridge door - safe/less easily broken -

do not store past expiry date - not safe to eat - risk of Salmonella -

do not freeze whole eggs - liquid inside shell expands and cracks shell

freeze only if separated – add sugar or salt to egg whites –

do not wash shells - removes protective cuticle - bacteria enter -

round end upwards - air space at top - holds yolk in place -

check for cracked eggs – bacteria enter – egg contaminated –

use in rotation – prevents waste –

keep away from strong smells/onions/fish – smell absorbed through pores in shell – etc.

(6 points) (2 points = 1 mark)

[3]

(d) Changes when egg is boiled

protein coagulates/sets/solidifies/hardens -

egg white at 60°C – egg yolk at 66°C –

egg white thickens – changes from transparent to opaque –

becomes firm - then rubbery if overcooked -

yolk thickens - becomes powdery when overheated -

green ring forms around yolk - ferrous sulfate -

iron in yolk - sulfur in egg white -

indigestible if overcooked

(8 points) (2 points = 1 mark)

[4]

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3 (a) Food additives

nutritional – vitamin C in fruit juice, calcium in white flour, vitamins A and D in margarine improve keeping quality/preserve/reduce spoilage - used in processed foods make food more attractive/add colour - flavour - smell can improve texture/consistency – stabilisers – emulsify fat and water - prevent separating - ice cream, mayonnaise anti-oxidant – prevent rancidity in fats can be natural but not found in particular food added to or synthetic – e.g. vitamin C can be made synthetically – can be artificial colours and flavours etc. E numbers have been approved by the European Community – must be used in smallest amount possible to produce desired effect some people are allergic/intolerant to certain additives long-term effect is not known – used in processed foods must be stated, by law, if contained in the product danger of adding nut extracts for those allergic to nuts etc. may be used to increase sales – longer shelf-life – reduce waste etc. (10 points) (2 points = 1 mark)

(b) Uses of fats and oils

spreading on bread - butter, margarine frying – corn oil, sunflower seed oil, dripping sauce-making - margarine, butter aeration – margarine traps air when creamed with sugar in cakes pastry-making – holds layers apart in flaky pastry – cake-making – shortening – crumbly texture of shortcrust pastry, rock buns etc. adding flavour - butter in cake-making improve keeping quality – butter used in rich cakes etc. sealing – melted butter/margarine on pate to retain moisture – flavour/colour adds calories without adding bulk - fried food dressings – French dressing form an emulsion - mayonnaise basting – adds moisture to meat cooked by dry heat/grilled/roasted decorating - butter icing make foods easier to eat/lubricates - butter on toast prevent sticking – oiled baking tins retains moisture - rich cakes glazes – melted butter on new potatoes, carrots etc. (10 points) (2 points = 1 mark)

(c) Reasons for choosing a vegetarian diet

religious beliefs
object to slaughter of animals – think it cruel – family custom
expensive to rear animals – land could be used for crops –
more people could be fed from same area of land
dislike of animal flesh – texture/taste etc.
meat is expensive to buy
belief that vegetarian diet is more healthy –
animal fat has cholesterol – associated with CHD
recent health scares – BSE/bird 'flu etc./salmonella
(10 points) (2 points = 1 mark)

[5]

[5]

[5]

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4 (a) Reasons for preserving food

enjoy food out of season
buy food when plentiful to use when scarce
to cope with a glut
to prevent waste
to give variety – food can be frozen, dried
new products made – jam, pickles etc.
to enjoy foods produced in other countries
to have a store of food
useful in emergencies etc.
to prevent the growth of yeast – mould – bacteria
to prevent loss of water/dehydration of fresh foods
(4 points) (2 points = 1 mark)

[2]

(b) Methods of preserving

Freezing

water in cells frozen – unavailable for growth of bacteria – bacteria cannot grow at low temperatures – dormant – e.g. fish, vegetables, meat etc.

Jam-making

high sugar content/60% added sugar — water withdrawn from cells — too concentrated for bacteria to thrive sealed in jars — to prevent entry of micro-organisms e.g. plums, strawberries, guava etc.

Pickling

salt to cover food – withdraw water from cells (by osmosis) acid/vinegar to replace water – micro-organisms cannot thrive in high acidic conditions e.g. onions, gherkins, cabbage etc.

Pasteuristion

heated to 72° C (162° F) – 15 seconds **or** 63° C (145° F) – 30 minutes cooled rapidly – destroys harmful bacteria e.g. milk, fruit juice etc.

<u>Ultra Heat Treatment (UHT)</u>

heated to 132°C – for not more than 1 second – destroys harmful bacteria – prevents souring e.g. milk, cream etc

Bottling and Canning

heat destroys bacteria – sealed to prevent further entry of bacteria e.g. fruit, milk, vegetables, fish etc.

Drying

water removed – bacteria cannot multiply without water e.g. fruit, meat, fish, herbs, spices etc.

Salting

water removed by osmosis – micro–organisms need water to thrive e.g. fish, beans etc.

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Smoking

salt removes water – phenols from smoke deposited on food surface inhibits growth of micro–organisms e.g. fish, meat

Accelerated Freeze Drying (AFD)

water sublimes in vacuum – structure remains same – micro–organisms need water to thrive e.g. coffee, vegetables, strawberries

Vacuum packing

air removed – entry of micro-organisms prevented – no oxygen for bacterial growth e.g. meat, fish, coffee etc.

<u>Irradiation</u>

packages irradiated – no change to appearance of food – cannot detect that process has taken place – micro-organisms destroyed by gamma rays – e.g. spices, strawberries etc.

Artificial additives

sulfur dioxide - nitrates - inhibit growth of micro-organisms

e.g. sausages, bacon etc.

Name of method 1 point Principles of method 2 points Named example 1 point

4 points for each method

3 methods of preserving 3×4 points = 12 points

2 points = 1 mark [6]

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(c) (i) Advantages and disadvantages of convenience foods

Advantages

save time little or no preparation little or no cooking useful in emergencies less washing up no waste large variety available readily available easy to carry portion control cook may not have ability to make product - e.g. puff pastry less equipment required may cook and serve in same container consistent product easy to store longer shelf life than fresh may be fortified/have added nutrients

Disadvantages

expensive
packaging may cause pollution
can be high in fat
can be high in sugar
can be high in salt
can be low in NSP
contain additives
small portions
loss of vitamins B and C during processing
loss of skills
6 points – at least 2 points from each area
2 points = 1 mark

[3]

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(ii) Labelling convenience foods

give information to consumer – some information is a legal requirement name of product – so consumer knows what is being bought description – further details e.g. tuna in brine/identify brand – reliability, consumer knows what to expect etc.

name of manufacturer — recognised as something seen before

address of manufacturer — in case of need to contact

ingredients – descending order – by weight – consumer may have

allergies etc.

cooking instructions – for best result/new product/inexperienced

storage instruction – to maintain best condition serving suggestion – to give ideas to consumer

picture of product – to give information on new products

weight – consumer can calculate unit cost/make comparisons special claims – reduced fat/no added sugar/added vitamin C etc.

vegetarian society symbol — so vegetarians know food is suitable wheat ear symbol — gluten free/coeliacs can consume recycle symbol — consumer knows how to dispose

nutritional information – consumer knows nutritional value per 100g

kilocalorie content – consumer may be calorie counting, trying to lose weight

sugar – useful for diabetics

fat – states amount of saturated fat –

consumer may have CHD – or wish to follow healthier

diet

salt – consumer can control salt intake if suffering from

hypertension

additives identified — consumer may wish to avoid/allergies etc.

may include nuts

- important information for people with allergies etc.

- if on special offer/can compare with other products etc.

(8 points) (2 points = 1 mark) [4]

5 (a) Reasons for the importance of cereals

readily available – easy to transport – easy to grow – cheap – carbohydrate/starch – source of energy – staple food – filling – easy to store – source of (LBV) protein – NSP in wholegrains – versatile – can be used for sweet and savoury dishes –

versatile – can be used for sweet and savoury disness

easy to prepare – easy to eat etc.

(6 points) (2 points = 1 mark) [3]

(b) Named cereals

wheat – oats – barley – rye – corn/maize/mealie meal –
millet – rice – sorghum
(4 points) (2 points = 1 mark) [2]

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(c) Storage of cereals

cool – dry – to prevent germination/growth – away from smells –
to prevent mould – and formation of lumps –
check regularly – can be attacked by weevils –
covered containers – to prevent entry of dust etc. –
sealed – to keep out moisture etc. –
keep bins off the ground – prevent attack by rats etc. –
use in rotation – do not mix old and new supplies –
decay could spread from old to new – wasteful –
wholegrain cereals do not keep as long – fat becomes rancid etc.
(6 points) (2 points = 1 mark)

(d) Choice of flour for making bread

strong/hard flour – high gluten content – becomes stretchy/elastic with moisture – and kneading – stretches to hold gases – gives firm structure – white flour – lighter – so rises better – plain flour – no chemical raising agent required – wholemeal flour – contains NSP – follows dietary guidelines – not SR flour – contains baking powder – yeast is raising agent (6 points) (2 points = 1 mark)

(e) Changes taking place when a loaf of bread is baked

rises/increases in size —
warmth of oven encourages fermentation of yeast —
carbon dioxide produced — gives open texture —
alcohol evaporates — water evaporates — pushes up dough —
yeast is killed by heat — no more carbon dioxide produced —
gas in dough expands when heated — protein/gluten coagulates —
shape sets — starch dextrinises — forms crust — browns —
crust lifts off/'oven spring' — light texture — fat melts
as carbon dioxide continues to expand after shape has set —
air replaces escaped gas — flour gelatinises —
Maillard browning — action of protein and sugar — etc.
(8 points) (2 points = 1 mark)

[4]

[3]

6 (a) Creaming

e.g. Victoria sandwich cake, queen cakes, Eve's pudding etc.
equal quantities – fat and sugar – with wooden spoon/electric mixer –
until light and fluffy – traps air – to help raise the mixture –
butter or soft margarine – good colour – and flavour –
caster sugar – finer grains – easier to cream
(6 points to include 1 example) (2 points = 1 mark)

[3]

(b) Basting

e.g. roast beef, grilled steak etc.

pour – or spoon – hot fat – over surface of food – from time to time
to prevent drying – or burning – adds flavour of fat –
and extractives
(6 points to include 1 example) (2 points = 1 mark)

[3]

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(c) Making a roux

e.g. base for sauce, soup or named e.g. – cheese sauce
equal quantities – fat and flour – usually margarine/butter/dripping
for colour – and flavour – melt fat – do not brown – stir in flour – wooden spoon
resembles a paste – cook over gentle heat – for 1 minute –
stir constantly – to prevent sticking/burning – starch absorbs fat –
looks 'sandy'/like marzipan (or other description)
(6 points to include 1 example) (2 points = 1 mark)

(d) Sautéing

e.g. mushrooms, potatoes, onions
toss – small/thin pieces of food – or cooked food –
in small amount – of hot fat – over low heat – type of frying – lid on pan – until fat absorbed –
quick method – browns food
(6 points to include 1 example) (2 points = 1 mark)

(e) Making a stock

e.g. vegetable, chicken, beef, fish boil – bones/small pieces of food – for a long time – strain to gain flavour/extractives – to add to soup/sauces/casseroles – instead of water – can use commercial stock cube (6 points to include 1 example) (2 points = 1 mark)

[3]

[3]

7 (a) Choice and care of kitchen knives

Choice

reliable brand – may have a guarantee –
variety of sizes for different purposes – peeling, chopping etc. –
serrated edge useful for slicing fruit and vegetables finely –
strong handle – comfortable to hold – handle firmly fixed –
wood, plastic etc. – easy to grip – no cracks/joins for dirt to collect
some have blade and handle as one piece of metal – easy to clean –
sharp – blunt knives slip – rigid blade – does not bend when cutting, except palette knives –
need to be flexible –
stainless steel – hard wearing –

large knives not usually stainless unless permanently sharp – blade able to be sharpened – for efficient cutting etc.

Care

store with blades pointing downwards – in a knife block – or with sheath over blade – or point protected by cork – use on a chopping board – wash in hot soapy water – dry thoroughly – to prevent rusting – do not use to cut frozen meat etc. unless specially for purpose – wash immediately after cutting lemon – to prevent staining metal – (10 points to cover choice and care) (2 points = 1 mark)

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(b) The disposal of kitchen waste

empty bin daily - wash daily - dry thoroughly - dry in sun do not leave water in bin - attracts mosquitoes line with plastic bin liner – easier to empty – keeps bin cleaner – disinfect regularly wrap all waste – tie bags – pour away liquid – wrap broken glass – clear up spills and mess around bin - prevent flies/insects cover bin tightly - prevent flies etc. - rinse and flatten cans removes smell of food - takes up less space recycle paper, glass, aluminium cans etc. if possible stand bin outside on bricks – allows air to circulate underneath – keep outside bin away from house - and from open windows so flies do not get into house easily do not pour fat down drains - blocks drains when fat hardens make sure U-bend contains clean water - disinfect at night leave no scraps lying about on work surfaces or floor encourages vermin do not allow bin to overflow – encourages animals/vermin/insects – etc.

(10 points to cover choice and care) (2 points = 1 mark)

(c) Hygiene in shops and markets

shop assistants should have clean overalls/aprons – bacteria from clothing can be transferred to food hair tied back from face/covered – prevent hair in food – clean short fingernails – bacteria thrive in dirt under nails – no nail varnish - chips and contaminates food do not lick fingers when picking up wrapping paper bacteria in mouth passes to paper then food – do not blow into paper bags to open them different knives and chopping boards for raw and cooked food – to prevent cross-contamination - should be hand-washing facilities in shop do not handle food and money – dirt on money passes to food – sell food in rotation - check dates on packages refrigerators and freezers should display temperature – if not cold enough bacteria will not be inactive in freezer food will spoil more quickly in refrigerator if not cold enough – keep premises free from vermin/flies - they carry bacteria which pass to food – no rubbish lying around shops or stalls – smells when rotting - food in freezers should be wrapped well food should not be stored above safety line in freezers do not sell out-of-date food - number of bacteria will be high risk of food poisoning etc.

(10 points to cover choice and care) (2 points = 1 mark)

[Section B Total: 60]

[5]

[5]

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